SECTION 4: CHINA'S ENERGY NEEDS AND STRATEGIES

Key Findings

- China's energy demand continues to grow at a rapid pace as its economy expands. Roughly 40 percent of all new world oil demand is attributable to China's rising energy needs.
- The United States and China currently follow different energy security policies regarding oil procurement. The United States secures its supplies via open international markets while China wants to own oil at the wellhead.
- China's energy acquisition efforts are expanding internationally, and specifically in Africa, the Western Hemisphere, Central Asia, and the Middle East.
- China appears to trade influence and assistance, including weapons technologies, arms, and other aid, for access to oil and gas in terrorist-sponsoring states, such as Sudan and Iran, greatly compromising U.S. efforts to combat terrorism, weapons proliferation, and human rights abuses.
- The United States should seek to influence China's energy policies and lessen the potential for future energy-related conflict by conducting joint research and development (R&D) programs with China to improve its energy efficiency and protect the environment.
- Both China and the United States are self-sufficient in coal. Clean coal and coal-to-liquids technologies are possible areas for mutually profitable joint R&D efforts and areas where the

United States could provide technological assistance that could benefit both nations, and enhance environmental protection.

Overview

World energy consumption is projected to increase dramatically in the next two decades. During this period, China will be one of the leading consumers of energy and energy-related resources. In order to avoid energy-related conflicts with the United States and other nations, it is of great importance that China's energy policies be consistent and integrated with the world's energy markets and for it to implement responsible energy efficiency and environmental protection practices pertaining to energy use.

As the world's leading consumer of energy-related resources, the United States needs to formulate a responsible and realistic policy for responding to China's growing energy demand and policies of acquiring petroleum sources, and assist China to achieve maximum energy efficiency.

The Global Energy Picture

World energy consumption, driven by growing global economies, is projected to increase by 57 percent in the next two decades. In emerging economies such as China's, energy use is projected to grow at a 3.2 percent average annual rate compared to a 1.1 percent average growth rate in mature economies.[148]

As stated by one witness at the Commission's July 2005 hearing, "Energy is a very political mineral . . . [and] all countries pursue energy security as a critical geopolitical objective."[149] China is no exception; it needs energy to sustain a robust economic growth rate that its leadership sees as necessary for it to maintain social and political stability.

Oil is the dominant global energy source, and the economies of China and the United States require much of the available supply. In an emerging Asia, including China and India, energy consumption is increasing dramatically; those developing economies will account for 45 percent of the projected increase in world oil consumption through 2025.[150]

Energy sector analysts and companies are divided in their assessments of the amounts and precise locations of world petroleum supplies—and how long the supplies will meet global demand. A recent report by the U.S. Energy Department's Energy Information Administration (EIA) titled "International Energy Outlook 2005" (IEO2005)[151] indicates there is sufficient oil to meet world aggregate demand during the next two decades; it is not expected to peak until after 2030. Some analysts and companies believe demand will exceed supply earlier, and others later. As the distance between the demand and supply lines narrow, there is an increasing likelihood some nations will be unable to secure supplies sufficient to meet their needs, which could lead to economic and social disruptions. There also will be a heightened risk of conflict among those nations competing for insufficient supplies. In this respect, China's projected increasing petroleum demand will be a prominent factor on the face of the global energy picture. Prudence dictates that policy makers operate on the basis of the more conservative assumptions.

Regardless of the adequacy of the global supply to meet aggregate global demand, political and other disruptions to the world's petroleum market may result in supply interruptions to one or more oil-importing nations well before aggregate demand exceeds aggregate supply. For example, with most of the world's untapped petroleum production capacity located in the Middle East, many experts believe the United States, China, and other net oil importing nations are vulnerable to supply disruptions resulting from political turmoil in that region. If such disruptions produce acute, geography-specific supply-demand imbalances, the affected nations will face substantial economic and political difficulties and pressures. If the United States or China or both were to be affected in this way, the two nations could find themselves on a petroleum collision course well before the world's aggregate petroleum supply is exhausted.

Coal ranks second behind petroleum as the world's leading energy source. The emerging economies of Asia, including China, will more than double their consumption of coal during the next twenty years.[152]

World electricity use is also predicted to double by 2025. It, of course, is a secondary energy source that is a product of other energy consumption. Coal and natural gas are, and will continue to be, the most important electricity-generating fuels, with nuclear power's role increasing and the roles of hydro generation and other renewables remaining lower but constant.[153]

According to the IEO2005, today's primary energy sources in the world ranked from most to least used are oil, coal, natural gas, renewables, and nuclear. Over that report's two-decade forecast period, fossil fuel use will grow most dramatically.

China's Energy Picture

Energy provides the foundation for China's economy, and its economic policy therefore is dependent on the success of its energy policy. China has 10.7 percent of global energy reserves, but because of its tremendous population, its reserves per capita are very low and it already is heavily importing energy resources. The discrepancy between domestic supplies and projected energy needs will only get worse, especially given China's predicted growth and consumption rates.[154]

Seventy percent of China's primary energy needs are met by coal, 25 percent with oil, 3 percent with gas, and only 2 percent from all other energy sources, including nuclear at 1.4 percent.[155]

China has abundant coal reserves, and coal "will remain the fuel of choice in China's rapidly expanding industrial sector" for the foreseeable future.[156] However, China's coal reserves are located in its interior, and even though it is the second largest coal exporter in the world, it is importing increasing amounts of coal, primarily from Australia, because of transportation costs and domestic infrastructure limitations within China.

While coal remains important, China's oil use is expected to grow by an annual average rate of 5.8 percent in the next ten years.[157] According to some experts "[b]ecause they rely so heavily on fuel-guzzling factories for growth, Asian economies use considerably more oil and gas to generate economic activity than in the West.

They also have less oil and gas of their own, which means they must import more of their oil than the United States and other countries." [158]

China became a net oil importer in 1993, and its oil imports have rapidly increased; as long as its economy continues to grow rapidly, China will continue to consume large amounts of foreign oil. And China is dramatically increasing its use of oil in its transportation sector. China's OPEC imports are expected to reach 7.3 mbd by 2025, further increasing its Middle East dependency.[159] China's domestic oil production is expected to remain roughly flat at approximately 3.5 mbd for the next 20 years to 2025, which will intensify its need to acquire and import oil from other nations.

Natural gas meets only 3 percent of China's total primary energy demand, but China's goal is to increase its use of natural gas so that it meets at least 8 to 10 percent of the nation's energy demand by 2025.[160] To this end, China has reached a number of supply agreements to increase imports of liquefied natural gas (LNG). Overall, China's natural gas consumption is expected to grow at an average annual rate of 7.8 percent, with much of the increased consumption going to electricity generation. Only China's nuclear power generation is expected to grow more rapidly, at a 9.9 percent average annual rate through 2025.[161]

China's Energy Policy and Objectives

As noted in the Commission's 2004 Annual Report to Congress, China's stated energy policy goals are to reduce its reliance on imports by further diversifying the types of energy it uses, broaden import sources, and improve the technology used in energy production and consumption to increase efficiency. In all likelihood, however, China will realize its goal of reduced dependency on outside energy sources only in the case of coal.[162]

To reach its goals, China primarily employs a two-pronged energy strategy based on (1) increasing domestic energy output, and (2) pursuing strategic deals to secure access to diverse international petroleum resources, preferably by obtaining rights to the physical production. China's pursuit of Unocal, as discussed later in this section, typifies its attempts to diversify and expand its international energy supplies and thus reduce its dependency on the Middle East. Nonetheless, its flat domestic petroleum supply and heavy reliance on Middle East oil is still unnerving to Beijing.[163]

China increasingly is focused on acquiring petroleum at the source, rather than purchasing it—as the United States and most other nations do—on international markets. In the past ten years China's national oil companies (NOCs) have acquired equity interests in oil projects in many countries, including Australia, Azerbaijan, Burma, Canada, Ecuador, Indonesia, Iran, Iraq, Kazakhstan, Oman, Peru, Sudan, Venezuela, and Yemen.

Witnesses presented two views to the Commission about China's strategy of acquiring petroleum at the source. According to Fareed Mohamedi, Chief Economist for PFC Energy, China's current campaign to overspend in hopes of securing oil at the wellheads may yield little benefit.[164] But other experts disagree, noting that China's strategy to purchase and secure oil resources depends on the

future. If there is increased political instability, greater scarcity, and thus an increased relevance of physical acquisition, then China's current attempts to secure energy resources "may well pay off." [165] And it is important to recognize that, as a non-market command economy, China is likely to pay a premium for supplies while subsidizing the costs to its consumers.

Other Chinese energy policies are focusing on structural economic adjustments to lower energy use intensity and improve the efficiency of energy exploitation. The central government is attaching increased importance to energy matters and has issued a series of new laws regulating the exploitation, utilization, and conservation of the country's energy resources. New policies also call for improving the efficiency of the energy sector's infrastructure.[166]

China's Global Search for Oil

The Middle East

According to testimony before the Commission, China is increasing its ties with Middle East energy producers. Saudi Arabia is China's largest crude oil supplier, and China is now exploring Saudi natural gas fields. The Saudi national oil company Aramco is a 25 percent investor in China's biggest refinery and petrochemical integration project.[167] Elsewhere in the region, China and Iran recently signed an oil deal worth $70 billion.[168] Reportedly, Iran currently supplies 13.6 percent of China's oil imports.[169]

Africa

China obtains 7 percent of its oil imports from Sudan, which may have Africa's greatest unexploited oil resources, and reportedly has invested $3 billion there—China's largest overseas investment project. In the past five years China has developed several of Sudan's oil fields, built a 930-mile pipeline, a refinery and a port.[170] China provides what Sudan's regime wants but has difficulty obtaining elsewhere: China reportedly is Sudan's largest arms supplier, and it is believed that 80 percent of Khartoum's oil revenues have been used for arms purchases.[171]

Central Asia

In 2006, Kazakhstan—which today produces a little more than 1 percent of the global oil supply—will begin exporting petroleum to China. China also is working with Kyrgyzstan and Uzbekistan on energy-related issues.[172]

The Western Hemisphere

China also is seeking energy sources in the Western Hemisphere. It appears to be focused on Venezuela for future oil supplies, although Venezuela currently does not have the ability to export a significant amount of oil to China—primarily because there are no practical means of moving it to the Pacific Ocean for shipment. Venezuela extracts about 2.6 mbd and sends 60 percent of this to the United States; Venezuela's goal is to produce five mbd by 2009. China already operates two oil fields in Venezuela and Venezuela's President Hugo Chavez has said that China will be allowed to operate 15 mature oil fields that could produce more than a billion barrels. Chavez also has invited Chinese firms to bid on gas explo-

ration contracts. In addition, Venezuela and China are exploring means of transporting oil from the wellhead to deepwater Pacific transfer points, including pipelines across Venezuela and Colombia or, alternatively, through Panama. China also plans to build refineries in Venezuela.[173]

Brazil's oil exports to China are increasing and reached 14 million barrels in 2004, up 180 percent from 2003.[174] In May 2004, Brazilian and Chinese companies signed a number of oil-related cooperation agreements. China has pledged to invest $10 billion in Brazil over the next two years and China's Sinopec is considering participating in a proposed 1,225 mile, $1.3 billion natural gas pipeline in Brazil.[175]

China recently has evidenced interest in Canada's significant oil reserves—which rank second only to Saudi Arabia's when Canada's oil sands and shale oil are taken into account—but the relationship is still in its very early stages. A dispute between the United States and Canada over allegations that the Canadian provinces were unfairly subsidizing softwood lumber exports and subsequent punitive U.S. tariffs is affecting energy-related relations between the two countries.[176] At the same time, Canada is increasing discussions and deals with Chinese petroleum companies, possibly in retaliation for the U.S. softwood tariffs.[177] To facilitate Canadian exports to China, a $2.5 billion Canadian pipeline to the Pacific would be needed.

The Impact of China's Energy Use and Policies on U.S. Interests

China's Strategy to Control Energy Sources

There is a clear distinction between U.S. and Chinese approaches to securing oil supplies. Whereas the United States has shifted from an oil import strategy that was based on controlling the oil at the wellhead to one that is based upon global market supply and pricing, China focuses on owning oil at the point of production. These different energy policies could bring both countries' energy interests into conflict.[178] This potential for conflict already has been visible in the effort during 2005 by a Chinese oil firm to purchase an American oil firm and its reserves, as described later in this section.

As China has become the world's most prolific manufacturing center, it also has become the world's largest consumer of minerals and other natural resources and the number two consumer of oil, second only to the United States. Latin America provides an example of how Chinese mercantilism is assuming a neo-colonialist pattern in which a dominant country secures markets for its manufactured goods in exchange for raw materials from its weaker partners. Ambitious mercantile powers aim to keep any advanced industrial project in their own country while relegating trade partners to subordinate supplier status.[179] The overseas expansion by China's NOCs fits this pattern.

Other Geostrategic Implications

According to testimony presented to the Commission, China is increasing its ties with Middle East energy producers, and the

United States should look carefully at the Sino-Saudi strategic oil partnership. As noted earlier in this section, Saudi Arabia currently is China's largest crude oil supplier, China is considering obtaining Saudi natural gas, and the Saudi national oil company Aramco is investing in China's biggest refinery and petrochemical integration project.[180] The United States is heavily reliant on Saudi oil and gas, and therefore Saudi sentiments toward our nation are of considerable import. While there is still a strong U.S.-Saudi relationship, Beijing would like to see Riyadh shift its friendship to China.[181] It is important for the United States to be mindful of this and to ensure that China not undermine the U.S.-Saudi relationship. Assessments of the significance of China's energy-related activities in the Americas vary, and the United States needs to monitor these activities closely, and carefully determine their importance and the most profitable way to respond to them. According to one witness who testified before the Commission, "China's energy acquisition in the Western Hemisphere will eventually make the United States more dependent on the Middle East and other volatile areas of the world. Every barrel of oil that China buys in America, whether it is in North America, Central America, or Latin America, essentially means one less barrel available for the U.S. market." [182] Yet there is relatively little apparent concern in the United States about Chinese activities in Latin America.[183]

Looking specifically at Venezuela—which currently supplies a large percentage of U.S. oil import requirements—reveals some troublesome signs. Chinese efforts, described in the previous segment of this section, to acquire Venezuelan oil and gas are increasingly successful. Today, as one Commission witness described the situation, Venezuela currently is unable to export a significant amount of oil to China, but that could change and the United States should keep this oil available for itself.[184]

Others, however, see no reason for concern regarding China's pursuit of petroleum from Venezuela, or its ability to interfere with U.S. access to petroleum from that country, because Venezuela is 'hard-wired' to the United States—among other reasons because the United States refines much of Venezuela's oil. According to Fareed Mohamedi, "the Chinese threat [to U.S. access to Venezuela's oil] has been slightly overblown." [185]

China's growing interest in Canada's oil reserves puts the United States in the difficult position of balancing its commitment to open market energy acquisition policies with the desire to retain access to nearby energy supplies. Canada's oil reserves rank second only to Saudi Arabia's when oil sands and shale oil are taken into account, and oil solely from Canada's sands would be enough to cover all U.S. requirements for the next 100 years, thus ending U.S. dependence on Middle East oil.[186] The United States needs to give considerably greater attention to how it wishes to address foreign competition for this adjacent resource, and pay particular attention to China's competition because of its policy of trying to obtain a lock on energy resources and remove them from the global energy market.

The Attempted Purchase of Unocal by the China National Offshore Oil Corporation

In mid-2005, the China National Offshore Oil Corporation (CNOOC), a 70 percent government-owned corporation, attempted to outbid Chevron, a large U.S. oil company, to acquire a smaller U.S. oil company, Unocal. On July 13, 2005, the Commission's Chairman testified before the House Committee on Armed Services about the U.S. national security dimensions of CNOOC's proposed takeover bid. The Chairman's testimony covered the nature of the proposed action, China's energy strategy, the long-term impact of China's energy practices on the U.S. economy and national security, and the role of the Committee on Foreign Investment in the United States (CFIUS) in the proposed acquisition.

The Chairman indicated that China's strategic approach to secure its oil supply at the source is mercantilist in nature and conflicts with U.S. energy policy that relies on open markets and promotes sharing arrangements in the event of supply disruptions. He also pointed out other features of the proposed transaction that were troublesome, including CNOOC's use of essentially unlimited Chinese government resources, including below-market financing, in what purportedly was a free-market acquisition attempt.

After it became clear that there would be substantial Congressional opposition to CNOOC's acquisition attempt, and that the CFIUS would likely give the offer a searching review, CNOOC withdrew its bid. The episode dramatized China's strategy to acquire oil and gas resources at the source and Beijing's willingness to pursue that strategy all the way to the acquisition of a U.S. energy company. As Chairman D'Amato noted in his testimony, "it is critical to persuade China to abandon this mercantilist spree to lock up attractive energy supplies wherever it can, and instead participate [with the International Energy Agency] to plan for sharing oil in the case of supply disruptions, and to participate in the open market buying of its supplies and begin relying on free markets to promote energy security for everyone."

U.S. Influence on China's Energy Policy

The United States and China have several energy-related similarities: both are rich in coal, biomass, and garbage, but they lack sufficient supplies of oil upon which both of them heavily depend. Progress in perfecting and deploying both clean coal[187] and biomass conversion technologies could make welcome contributions to reducing oil consumption in both nations. Therefore, according to one witness who testified before the Commission, there is "tremendous potential [for the two nations to cooperate] in these fields."[188]

Globally, China is increasingly active in striving for energy security in ways that portend direct competition for energy resources with the United States. This is producing a possibility of conflict between the two nations. As Amy Myers Jaffe testified before the Commission in 2003, China views the United States as a potential enemy, largely as a result of the possibility of energy-related conflict.[189] In order to avoid such an outcome, which could entail terrible human and economic costs for both nations and threaten global stability, it is vital for the United States to work with China to attempt to remove or reduce the points of friction.

The United States needs to work diligently to persuade China to participate with the International Energy Agency (IEA) and switch its strategy of acquiring and hoarding oil reserves to purchasing its supplies on the open market. As recommended in the Commission's 2004 Annual Report, China should work with the IEA to develop a meaningful strategic petroleum reserve and coordinate the release of stocks in supply disruption crises or speculation-driven price spikes.[190] The Commission also encouraged increased bilateral cooperation in improving China's energy efficiency and environmental performance.[191] Recently, Deputy Secretary of State Robert Zoellick called on China to work with the United States and other nations on energy-related issues, including working through the IEA to build and manage strategic reserves.[192] While a number of existing institutions have addressed portions of this agenda, its importance warrants greater attention.

China also can profit from U.S. technical assistance in a number of areas to increase the efficiency of its energy consumption and thereby reduce demand. Among these are energy use intensity reduction, clean coal technologies, coal-to-liquids technologies,[193] and combustion efficiency improvements. Both nations could benefit from joint R&D programs—or from multilateral programs in which they both participate—directed toward (1) areas where greater efficiency can be realized, (2) switching some current reliance on oil to coal and natural gas—supplies of both being estimated to last longer and to be more easily obtained than oil—and doing so in ways that will not result in environmental damage, and (3) enhancing the economic, technical, and logistical feasibility of using renewable energy sources in lieu of some portion of the projected increases in demand for oil. The United States and China also could work together to develop and implement utilization of "next generation fuels" such as hydrogen.

Inertia is likely to increase rather than decrease the likelihood that competition for energy sources, particularly oil, will create differences between China and the United States in coming years, and if these differences are permitted to grow into significantly conflicting interests and objectives, there is a risk that the conflicts will escalate into long-term animosity. It is profoundly in the interests of both nations to avoid this outcome. Conscious, concerted, intensive efforts need to be made by the U.S. government to enlist China in the types of cooperative activities described above. To the fullest extent possible, the United States should try to catalyze the development of such efforts on a multilateral basis. In undertaking these efforts, the United States will need to be cognizant that China will only agree to participate if it sees its own interests advanced by the effort.